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**Model 2270
Stereophonic
Receiver**

Handbook of Instructions

We Sound Better



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**Model 2270
Stereophonic
Receiver**

MARANTZ CO., INC. · P.O. BOX 99 · SUN VALLEY, CALIFORNIA · 91352
A WHOLLY-OWNED SUBSIDIARY OF SUPERSCOPE INC., SUN VALLEY, CALIFORNIA 91352

WARRANTY

All parts of MARANTZ products are fully guaranteed for a period of THREE YEARS from date of purchase, except for tubes which are guaranteed for NINETY DAYS from date of purchase, and except for speaker products. Speaker products are guaranteed as follows: all speaker and electronic components are fully guaranteed for a period of THREE YEARS from date of purchase; the cabinetry is guaranteed against manufacturing defects only, for a period of TWO YEARS from date of purchase.

In the event that service is required, all necessary parts and labor will be furnished free of charge during the above stated periods. The conditions of this Warranty, and the extent of the responsibility of MARANTZ COMPANY, INC. under this Warranty, are as follows:

1. The purchase must have been made from an authorized MARANTZ dealer.

2. The Warranty extends only in favor of the original, registered owner of the product.

3. The Warranty Registration Card must be transmitted to MARANTZ COMPANY, INC., P. O. Box 99, Sun Valley, California 91352, not later than TEN DAYS from date of purchase.

4. The Warranty will become void if repairs are effected by anyone other than an authorized MARANTZ Service Station.

5. If it becomes necessary to send this product or any defective part to MARANTZ COMPANY, INC., or to an authorized MARANTZ Service Station, all shipping charges must be fully prepaid. If the entire instrument is sent, it must be shipped in its original package. No accessories should be shipped with the product. If any accessories are shipped with the product, MARANTZ COMPANY, INC. shall have no liability whatsoever for loss of or damage to any such accessories, nor for the safe return thereof.

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7. This Warranty is void if the Serial Number has been altered or removed. This Warranty shall not apply if the product has not been connected or operated in accordance with the instructions furnished by MARANTZ COMPANY, INC. This Warranty shall also be void if the product has been altered or repaired in any way which MARANTZ COMPANY, INC. believes has affected the stability or reliability of the product.

8. MARANTZ COMPANY, INC. shall have no liability whatsoever for consequential damages. The sole responsibility of MARANTZ COMPANY, INC. under this Warranty shall be limited to the repair of the product, or replacement thereof, in the sole discretion of MARANTZ COMPANY, INC.

9. This Warranty does not include the furnishings of labor or parts for user maintenance, as the same is described in the instruction manual or handbook furnished with this product.

10. This Warranty is valid only with respect to repairs effected by an authorized MARANTZ Service Station.

11. EXCEPT TO THE EXTENT THAT APPLICABLE LAW PRECLUDES A DISCLAIMER OF WARRANTY, THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS WITH RESPECT TO THIS PRODUCT, NOR ARE THERE ANY OTHER WARRANTIES WHICH EXTEND BEYOND THE PROVISIONS OF THIS WARRANTY. ORDINARY PERIODIC CHECK-UPS ARE NOT INCLUDED IN THIS WARRANTY.

12. MARANTZ COMPANY, INC. reserves the right to make changes in design and/or improvements upon its products without any obligation to include these changes in any products theretofore manufactured.

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Should there be any questions, please contact the
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PURCHASER'S RECORD ►

REGISTRATION FOR MARANTZ 3-YEAR GOLDEN WARRANTY

Model: Marantz Model 2270

Serial No. _____

Purchaser's Name _____

Purchased From (Name) _____

Address _____

Price Paid \$ _____ Date Purchased _____

Date Warranty Reply Card Mailed _____

The above information becomes your permanent record of a valuable purchase. It should be promptly filled in at the same time that you fill in and mail the warranty registration reply card to Marantz. This information provides a valuable insurance record and must also be referred to should you have any correspondence with Marantz.

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GENERAL DESCRIPTION

Your Marantz Model 2270 all solid state receiver incorporates the advanced circuitry for which Marantz is famous in the audio component industry.

Unparalleled technology and innovation made possible this combination of three superb component sections on a single chassis: Tuner, Preamplifier, and Power Amplifier. Internal connections between these component sections ensure optimum performance from each section, and retain the full flexibility of separate components. The extraordinary flexibility of your Model 2270 permits the connection of: two stereo pairs of loudspeakers, headphones; a turntable or record changer; an additional tuner (such as SW or LW) and a TV sound source. Record, playback, and copying capabilities are included for a tape playback deck or two recorders.

FOREWORD

For optimum performance and enjoyment from your Model 2270 Stereo Receiver, please study these instructions carefully. Installation and operation are not complicated, but its flexibility and features deserve your becoming familiar with its controls and connections.

This manual is divided into two parts. The first covers installation and operation in simple, non-technical language. The second describes the 2270 in more detail with technical specifications, functional explanations, and special application discussions.

For quick identification of the controls and connections, references to them are printed in bold-face type, exactly as they appear on the front and rear panels of your Receiver.

AFTER UNPACKING

It is advisable to save all original packing material to prevent damage should you wish to transport or ship the Receiver (refer to Figure 16 for packing instructions).

Please inspect your Model 2270 carefully for any signs of damage in transit. It has undergone stringent quality control inspection and tests prior to packing, and left the factory in perfect operating condition.

If the unit is damaged, notify the carrier without delay.

Only the consignee may institute a claim with the carrier for damage during shipment. However, the Marantz Company will cooperate fully in such an event.

Save the damaged carton as evidence for inspection by the carrier.

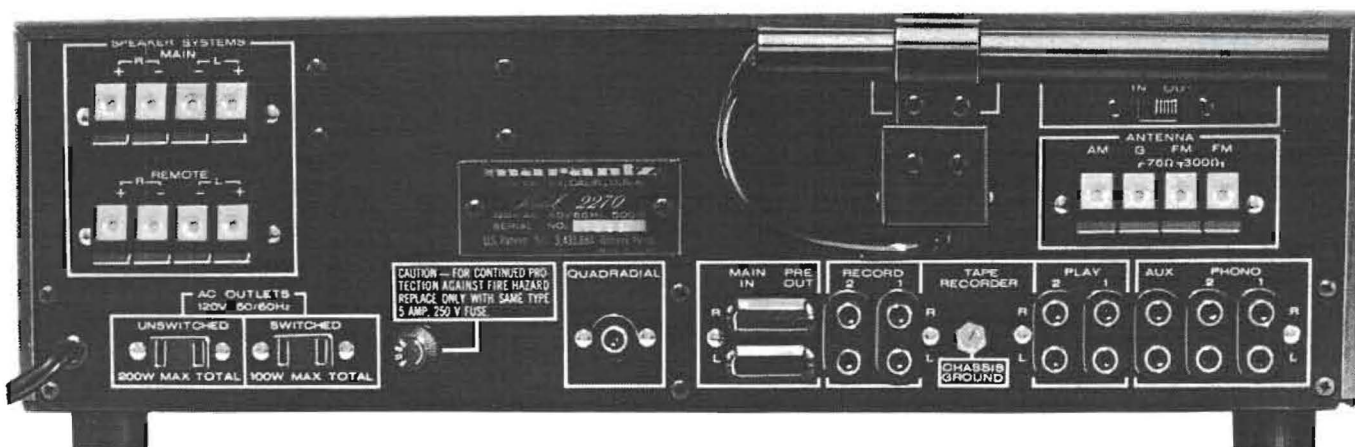


Figure 1. Rear Panel Connection Facilities and Adjustments

PREPARATION FOR USE

REAR PANEL CONNECTIONS

All signal connections to the Model 2270, with the exception of the FM antenna and loudspeakers, should be made with shielded audio cables. Figure 1 shows the location of input and output jacks on the rear panel. These jacks are for "permanent" connections. Front panel jacks and their use will be discussed later. The rear panel signal connections are arranged in stereo pairs. To avoid confusion, connect one cable at a time between the 2270 and the other components of your system. In this way, you will avoid cross-connecting channels or confusing signal sources with destinations.

PHONO 1 & 2

The PHONO jacks are intended for use with magnetic phono cartridges requiring a standard 47,000-ohm resistive load. If hum is heard when playing records, it is usually evidence of improper grounding or shielding of the record player or its connections. Try reversing the polarity of the turntable's power plug. If this is ineffective, connect a separate ground wire from the turntable or record changer frame to the **CHASSIS GROUND** binding posts of the Model 2270. If the tone arm is mounted on a wood panel or is otherwise insulated from the turntable frame, connect the tone arm mounting base to the grounding wire with a short wire. If the two pairs of signal wires in the arm have a single overall shield, try grounding the shield instead of the arm itself. Keep the two PHONO connecting cables and the grounding wires close together to minimize "ground loops."

PLAY

The pairs of **TAPE IN** jacks serve two purposes:

1. With the selector switch in "TAPE" position, signals can be played from a tape recorder set for playback mode of operation. This permits playing the tape source stereophonically or monophonically (determined by position of **MONO IN** pushswitch).
2. With the selector switch in any other position, and while your tape recorder is recording, you can monitor the resulting tape quality by depressing the **MONITOR (TAPE)** pushswitch. This presumes that your recorder is equipped with separate record and playback heads and separate record and playback electronics.

RECORD 1 & 2

Connecting these jacks to the line or "radio" inputs of a tape recorder permits recording from the program source indicated by the selector switch. The signals available at this pair of jacks are not affected by the **balance**, **volume**, **treble**, **mid**, **bass**, **LOW FILTER**, **Hi FILTER**, **LOUDNESS**, **MONO IN (L, R)** and **Hi BLEND** pushswitches on the front panel.

AUXILIARY

High level **AUX** input jacks are for miscellaneous sources such as extra tape players with self-

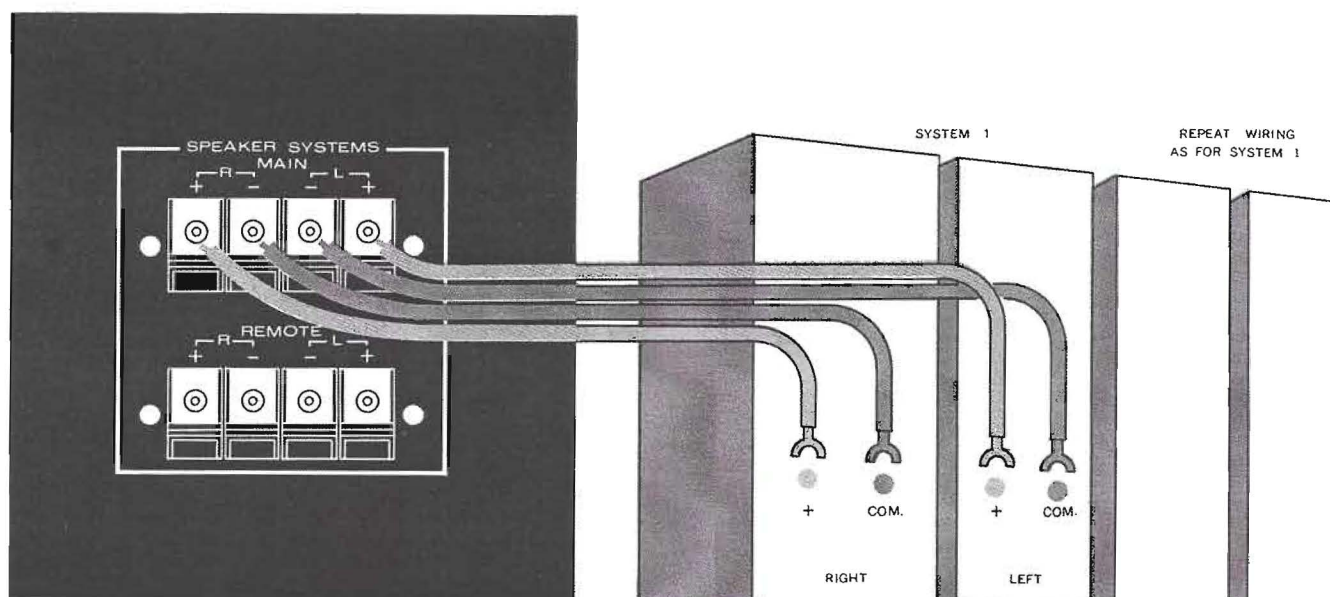


Figure 2. Loudspeaker System Connections

contained playback preamplifiers, phono cartridges with RIAA-equalized high-level output, additional tuners and/or receivers, TV sound outputs, and other external components.

QUADRADIAL

In anticipation of the coming of 4-channel stereo broadcasting, your Model 2270 is equipped with an output **QUADRADIAL** jack. The signal available at this jack is the unequalized, buffered output of the FM discriminator. Its level, frequency response characteristic and output impedance are ideal to drive any 4-channel adaptor. This jack can also be used as a simple white noise generator for frequency response check of loudspeakers or amplifiers with the Model 2270 in FM mode and tuned off from any FM signal.

MAIN IN and PRE OUT

The inter-connections from the Model 2270 on the preamplifiers outputs to the power amplifiers inputs are performed externally. Special jumper plugs normally interconnect these **MAIN IN** and **PRE OUT** jacks. Removing these two special jumper plugs allows you to use your 2270 as an independent basic stereo amplifier and/or an independent stereo control center. Be sure to replace the jumper plugs between the **MAIN IN** and **PRE OUT** jacks for normal operation.

LOUDSPEAKER SYSTEMS

The **SPEAKER SYSTEMS** terminals on the rear panel will accommodate two stereo pairs of loudspeaker systems of rated impedance between 4 ohms and 16 ohms. When using only one stereo pair of loudspeakers, connect them to the **MAIN** terminals. The **REMOTE** terminals are for a second stereo pair of loudspeakers.

Selection of loudspeaker systems is made with the **MAIN-SPKR-REMOTE** pushswitches on the front panel.

Use caution when connecting your Model 2270 to a loudspeaker with built-in power supply such as an electrostatic loudspeaker. The "common" connection terminal of such a speaker may be capacitively grounded through its power supply. Make sure the **GROUND** terminals of the Model 2270 are connected to the "common" terminals of such loudspeaker systems.

Ordinary # 18-gauge, 2-conductor lamp cord ("zip-cord") may be used for normal distances (to about 25 feet) between your 2270 Receiver and your loudspeakers. For longer lengths, #16-gauge or heavier wire should be used to ensure optimum speaker performance.

When connecting a stereo pair of loudspeakers, it is important to ensure correct relative phasing (polarity). When using identical loudspeakers, simply code one wire of each pair at both ends with a knot, tape, etc. (Note: Close inspection of stan-

ard zipcord will reveal some form of coding on the insulation, e.g., ridge or groove on one edge, one of the wires may be "silver" while the other is bare copper.) Coded wires help insure identical connections for each channel.

For each channel, the coded wire can be connected between the "common" terminal of your loudspeaker and the **GROUND** terminal of the amplifier channel. The remaining uncoded wire is then connected between the remaining loudspeaker and amplifier terminals. This insures correct polarity or phasing of identical loudspeakers.

If there is any doubt about phasing of loudspeaker pairs, or if they are not identical loudspeakers, a simple listening test can verify correct phasing. With program signals fed to both channels, and with the **MONO IN** pushswitches depressed, the sound should appear to originate at a point midway between the loudspeakers, with the balance control centered. As the balance control is turned away from the center position, the sound source should appear to move toward one of the loudspeakers. Room acoustics can sometimes make this test ambiguous or confusing. If so, temporarily move the loudspeakers as close together as possible. Then set the controls for balanced MONO operation and listen to program material with strong bass passages. Reverse the wires to one of the loudspeakers and listen to the same passage again. If there is noticeably less bass with this reversed connection, change the connections back to the original arrangement. If there is noticeably more bass, leave the wires connected in reverse.

These phasing procedures should be used with each stereo pair of loudspeakers, whether **MAIN** or **REMOTE**. If both pairs of loudspeakers are used in the same listening area, ensure that the **MAIN** pair is also "in phase" with the **REMOTE** pair.

CAUTION:

NEVER DIRECTLY CONNECT THE LOUDSPEAKER TERMINALS OF ONE CHANNEL IN PARALLEL WITH THOSE OF ANY OTHER. ANY RESULTING DAMAGE IS NOT COVERED UNDER WARRANTY.

FM ANTENNA

The best FM reception is obtained with a Log-Periodic type antenna, mounted on a good quality rotor system.

For fringe areas, Marantz recommends a Log-Periodic antenna with six or more elements designed expressly for FM reception. For minimum local noise and multipath pickup by the lead-in wires, use a balanced and shielded 300-ohm

cable. (An unshielded lead-in wire can act as an omnidirectional antenna, and can cancel the directional benefits of your antenna.) Low-loss 300-ohm shielded cable consists of two inner conductors plus an outer shield and insulating jacket. This type of shielded cable effectively prevents the lead-in from contributing multipath distortion.

For rural areas, it is recommended that a local dealer be consulted about antenna installation and lightning arrestor protection. Master antenna systems are not recommended for use with your Model 2270; such systems are usually designed expressly for television reception and frequently suppress FM signals before distribution. In addition, master antenna systems often severely limit good quality FM reception.

Where outdoor antennas are prohibited or inconvenient, use a simple form of 300-ohm, TV "rabbit ear" antenna or the simple ribbon-type folded dipole antenna supplied with the Model 2270. Both are practical and will give satisfactory results in primary signal areas. Your Model 2270 Receiver will accept either a 75-ohm or 300-ohm antenna. (See diagram Figure 3.) The 300-ohm antenna cable should be connected to the two terminals marked **FM** on the **ANTENNA** terminal. When using 75-ohm coaxial antenna cable, connect its shield to the "**G**" (**GROUND**) terminal, and its inner or center conductor to either of the **FM** terminals.

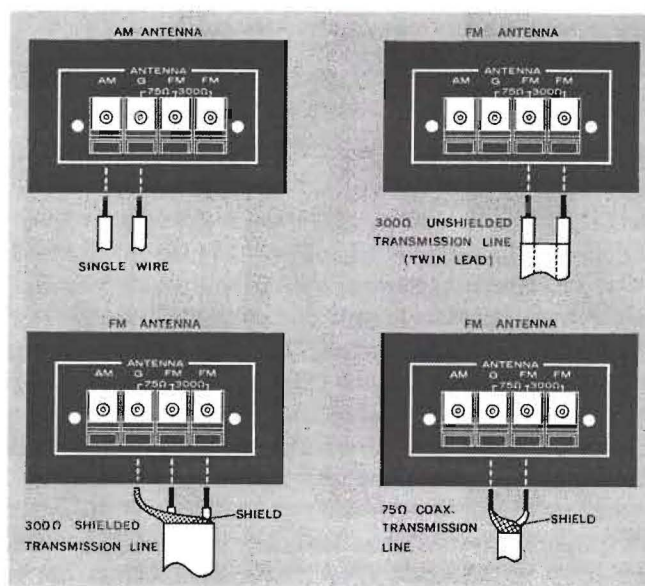


Figure 3. FM/AM Antenna Connection

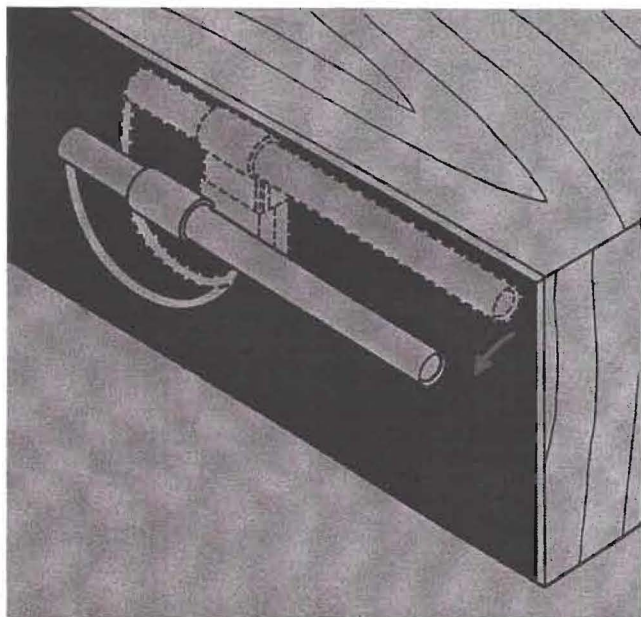


Figure 4. AM Ferrite-rod Antenna

ANTENNA ATTENUATOR

The **ANTENNA ATTENUATOR** can be switched into or out of the antenna circuit. Use the **ANTENNA ATTENUATOR** switch in the "IN" position only when overloading is apparent from reception of one station at several points of the dial and is affecting reception of a desired station. Overloading may also cause severe distortion which will not disappear with proper antenna orientation. (Note: With the **ANTENNA ATTENUATOR** switch "IN," the FM sensitivity and the number of stations that can be received are reduced.)

AM ANTENNA

Your Receiver is equipped with an AM ferrite-rod antenna. **BEFORE USING THE MODEL 2270, PULL THE ANTENNA AWAY FROM REAR PANEL AS SHOWN IN FIGURE 4.**

The ferrite-rod antenna will give you satisfactory results to primary signal areas. However, an outdoor antenna will provide better reception in rural areas. Two single wires are required to make an AM outdoor antenna. First, connect one end of a single wire to the AM antenna terminal on the rear panel, and the other end at a very high position outdoors (the higher the better,) or swing it from the window of your room. Next, connect the other single wire between the "G" (**GROUND**) terminal of your Model 2270 and an earth ground (such as a water pipe.)

CONNECTION TO AC OUTLET

With the front panel **power** pushswitch "out," plug the line cord into an electrical outlet supplying the proper voltage.

CAUTION: DO NOT PLUG YOUR MODEL 2270 INTO A DC OUTLET SINCE SERIOUS DAMAGE WILL OCCUR.

CONVENIENCE OUTLET

One **UNSWITCHED** and one **SWITCHED AC OUTLET** are provided on the rear panel for powering associated components of your system (tape recorder, record player, etc.).

SIMPLIFIED OPERATING PROCEDURE

When operating the Model 2270 Stereo Receiver for the first time, follow these simple directions. Later, full advantage can be taken of its versatility with the remaining controls and pushswitches.

- Step 1. Connect the FM antenna to the appropriate terminals on the rear panel.
- Step 2. Connect the speakers to the **MAIN** speaker terminals.
- Step 3. Check that all pushswitches are in the "out" position. Pushswitches in the "in" position should be depressed for releasing to the "out" position.
- Step 4. Turn the **volume** control all the way to the left (counter clockwise) and set the **balance** control in mid-position (pointer to dot at 12 o'clock).
- Step 5. Rotate **treble**, **mid**, and **bass** controls to the 12 o'clock position (each pair of pointers to dot).
- Step 6. Set **MAIN** Speaker pushswitch "in," and **REMOTE** "out" (assuming your loudspeakers are connected to the **MAIN** amplifier terminals).
- Step 7. Turn on system power by depressing the **power** switch.
- Step 8. Select the desired program source by setting the selector switch to the appropriate position. If FM or AM is selected, rotate the Gyro-Touch

TUNING knob until the desired station is tuned. Adjust the **volume** control for comfortable listening volume.

The tuner section of the Model 2270 is equipped with electronically triggered circuits which automatically mute interstation noise and automatically switch to the proper mode of operation for stereo and monophonic FM broadcasts. In addition, the **STEREO** indicator light automatically indicates a stereo broadcast.

TUNING METERS

The Model 2270 is equipped with two meters, a **SIGNAL STRENGTH MULTIPATH** meter and a **TUNING** meter.

1. The **SIGNAL STRENGTH/MULTIPATH** Meter is dual purpose:
 - a. In normal operation, it indicates the signal strength of the AM or FM signal to which your receiver is tuned.
 - b. If you push in the **MULTIPATH** pushswitch -- and only so long as you hold it in -- this meter will indicate multipath, to enable you to point your FM antenna in the best direction to optimize FM reception.
2. The **TUNING** meter operates on FM only and indicates correct station tuning.

TUNING

AM: For optimum AM reception, tune to the desired station. Then rotate the tuning knob slightly back and forth until the maximum reading is obtained on the **SIGNAL STRENGTH** Meter. The **TUNING** Meter is not used for AM.

FM: Switch the **selector** to FM and tune to the desired station. Then slowly rotate the tuning knob slightly back and forth until maximum reading is obtained on the **SIGNAL STRENGTH** Meter, and the **TUNING** Meter points to the center scale position. Your Receiver is now properly tuned.

FM ANTENNA ORIENTATION

With a rotatable FM antenna, you may further optimize FM reception by pointing the antenna to the proper direction for minimum multipath.

First tune to the desired station as above. Then hold in the **MULTIPATH** pushswitch while you rotate the FM antenna. Stop the antenna at that position for which minimum deflection is indicated on the **MULTIPATH** meter. Then release the **MULTIPATH** pushswitch to restore the meter to its normal **SIGNAL STRENGTH** function.

MONO IN (L, R) SWITCH

Depressing both **MONO IN (L, R)** pushswitches will convert all input signals to the monophonic mode excluding signals at the rear panel record and front panel **TAPE dubbing** jacks.

While playing a single channel source such as TV or AM, depress both **MONO IN (L, R)** pushswitches to feed the signal through both channels.

When playing a monophonic phonograph record, use these pushswitches to suppress rumble, common mode noise and pinch - effect distortion.

TAPE/SOURCE MONITOR SWITCH

When this pushswitch is out (**SOURCE**) the program being recorded and heard is determined by the setting of the **selector** switch. With the **MONITOR** pushswitch in (**TAPE**), the amplifier input connections are switched to the output of the tape recorder without affecting the signal presented to the tape recorder without affecting the signal presented to the tape recorder's input. Thus you may listen to the source signal before and after it is recorded (on a 3-head tape recorder).

A tape recorder to be monitored is selected by this pushswitch. When this pushswitch is "out (2)," the tape recorder connected to the **PLAY 2** jacks on the rear panel is monitored. With the pushswitch "in (1)," the tape recorder connected to the **PLAY 1** jacks is selected. If a tape recorder is connected to the **dubbing IN** jacks on the front panel, the tape recorder is always selected regardless of any position of the pushswitch.

LOUDNESS SWITCH

For more pleasing tonal balance at low level listening, the bass and treble should be boosted. With the **LOUDNESS** switch depressed, the bass and treble are automatically boosted at low listening levels to maintain this tonal balance.

Hi-BLEND SWITCH

With the pushswitch "in," stereo separation is slightly reduced for high frequencies. For weak FM signals with excessive noise and/or interference, this offers moderate separation with moderate suppression of out-of-phase noise and distortion components. Unlike most FM noise filters, this does not sacrifice full frequency response.

Hi-BLEND will also reduce phonograph record pinch-effect distortion and vertical noise components, but will not materially affect tape "hiss."

For normal listening, leave this pushswitch "out."

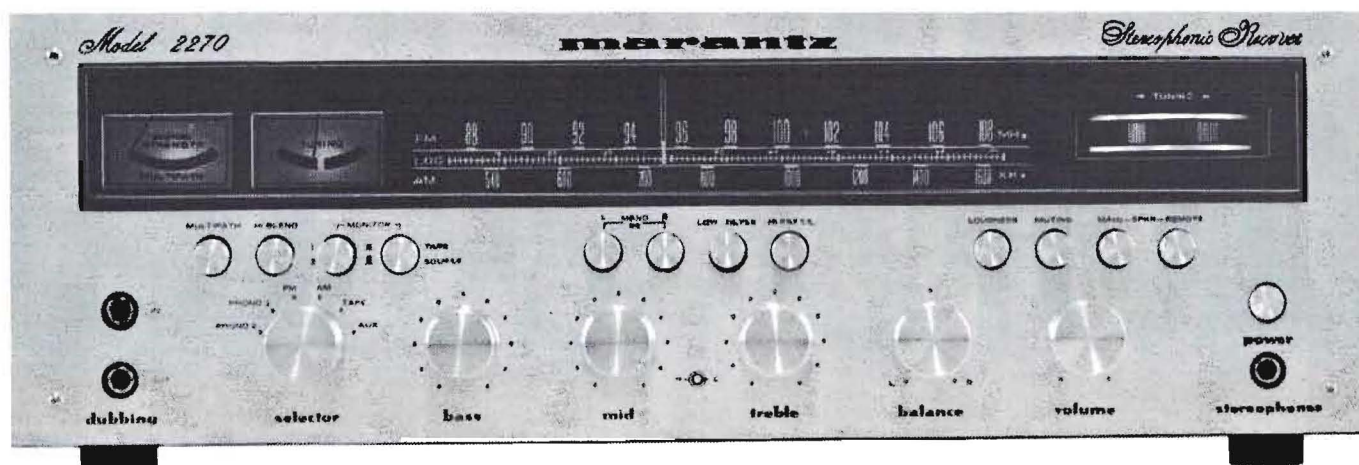


Figure 5. Front Panel Controls and Jacks

MAIN CONTROLS AND SWITCHES

LOW FILTER SWITCH

The low frequency filter can be used to reduce turntable rumble and low frequency noise. It will also, however, slightly attenuate program material, and should therefore be used judiciously. The "out" position switches the filter out of the circuits.

Hi FILTER SWITCH

AM radio reception is sometimes subject to a high pitched interference "whistle" from a nearby adjacent AM channel. The high frequency filter will suppress this interference, the "scratchy" noise from phonograph records, and tape "hiss." The filter will also, however, slightly attenuate high frequency program material. The "out" position switches the filter out of the circuits.

MUTING SWITCH AND LEVEL CONTROL

When tuning to FM broadcasts with the **MUTING** switch in its "in" position, the muting circuit will eliminate interstation noise. The muting threshold can be varied by rotation of the **MUTING LEVEL** control on the rear panel. To prevent muting very weak stations along with the noise, the muting function may be turned off by releasing the **MUTING** pushswitch to "out" position, thus switching all muting out of the FM circuits.

SELECTOR SWITCH

The **selector** switch selects the program source for listening or recording. With tape recorder's outputs connected to the rear panel **TAPE RECORDER PLAY (1, 2)** jacks, you can select tape listening by rotating the **selector** switch to the "TAPE" position (with the **MONITOR (TAPE/SOURCE)** pushswitch "out". The **MONITOR (1/2)** pushswitch then selects between tape units plugged into rear panel **PLAY 1** or **PLAY 2** jacks.

BALANCE CONTROL

This control simultaneously alters the output level of both channels. As the knob is turned away from the normal 12 o'clock position, it decreases the level in one channel, while it increases the level in the other channel. (Because the **balance** control knob has been set for precise electrical balance when the pointer is at the indicator dot at the 12 o'clock position, there may be slightly greater mechanical rotation off center in one direction than in the other.)

VOLUME CONTROL

This dual control maintains stereo balance at all normal settings. It controls the level of both output channels simultaneously and has no effect on the recording outputs.

BASS, MID AND TREBLE CONTROLS

These controls are used to adjust the tonal balance of program material to suit your individual listening preference. Each control is of the dual concentric friction-coupled type. This permits separate control of each channel to compensate for unbalanced room acoustics or for any other tonal imbalance in program material. The friction-coupled feature conveniently allows simultaneous adjustment of both channels. The smaller knob adjusts the response of the left audio channel, while the larger knob adjusts the right audio channel.

MAIN-SPKR-REMOTE SWITCH

These switches select the loudspeaker terminals to which audio power is fed. The **MAIN** or the **REMOTE** stereo pair of loudspeakers may be operated, either pair, or both simultaneously if both switches are depressed. With the two **MAIN-SPKR-REMOTE** switches in the normal "out" position, all loudspeaker terminals are internally disconnected from the power amplifier sections. The signal at the headphones jack is not affected by the **MAIN-SPKR-REMOTE** switches. The "out" position allows "private listening" to stereo headphones.

FRONT PANEL JACKS

DUBBING OUT

This output is internally connected in parallel with the rear panel **RECORD** jacks (1 and 2). Thus, any signals available at the rear panel jacks are simultaneously available at the front panel. You can connect the recording inputs of an external recorder to this jack, using a standard 3-conductor plug. Plugs of this type have an insulated tip, an insulated ring, and a sleeve for common return or ground. The tip of the plug receives the left channel of a program, and the ring receives the right channel (see Figure 6).

DUBBING IN

This jack has a built-in switch which automatically disconnects the rear panel **PLAY** (1 and 2) jacks when you insert a standard 3-conductor phone plug. It is intended to receive the playback outputs of an external tape recorder.

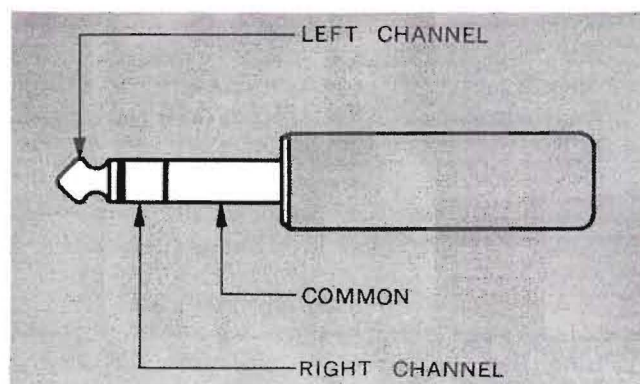


Figure 6. Stereophone Plug

STEREOPHONES

This jack accepts the standard 3-conductor phone plug used on standard stereo headphones (see Figure 6). It is internally connected to the power amplifier section through isolation resistors to provide adequate sound level with popular low impedance headphones as well as with high impedance ones. Two or more sets of headphones may be used with the aid of "Y" connectors. The headphone jack output is not affected by the **MAIN-SPKR-REMOTE** switches.

SOME SUGGESTIONS ON USING TAPE RECORDERS WITH YOUR MODEL 2270

There are several ways to connect and operate tape recorders with your receiver. To avoid confusion in the following discussion, reference to "tape monitoring" assumes that the recorder is equipped with separate record and playback heads and separate record and playback preamplifiers. To further simplify this discussion, a tape recorder normally connected to the rear panel **PLAY 1** jacks will be referred to as the "main 1" recorders. A separate recorder normally connected to the front panel jacks will be referred to as the "external" recorder. This general arrangement is illustrated in Figure 7.

RECORDING AND PLAYBACK

The simplest system involves only one tape recorder, whose inputs are connected to the rear panel **RECORD** (1 or 2) jacks, and whose playback outputs are connected to the corresponding rear panel **PLAY** (1 or 2). An equally simple arrangement with only one tape recorder would be to use the front panel **dubbing IN** and **dubbing OUT** jacks as previously described.

RECORDING

To make a recording, set the selector switch to the desired program source and put the recorder into the "record" mode of operation. With the **MONITOR (TAPE/SOURCE)** pushswitch in the "out" position, the original program source will be heard. Depress the **MONITOR (TAPE/SOURCE)** pushswitch to hear the "results" of the recording while it is in progress.

Caution: With the tape recorder in the "record" mode, be careful not to place the selector switch in the "TAPE" position while the **MONITOR (TAPE/SOURCE)** pushswitch is "out". This feeds the recorder's output signals back to its input terminals, establishing a reverberating loop. If the recorder's playback level happens to be set higher than its record level, the resulting echo or "howl" will rapidly increase in volume level. This won't harm the recorder or receiver, but the audible effect from the loudspeakers can be annoying.

PLAYBACK

To play a tape on (either) main tape recorder, turn the selector switch to "TAPE," and the **MONITOR** pushswitch to (desired) 1 or 2. To play an external tape recorder, connect its outputs to the **dubbing IN** jack on the front panel. When playing either main recorder, make sure nothing is plugged into the **dubbing IN** jack, or the main recorder(s) outputs will be internally disconnected in the receiver.

MAKING TWO RECORDINGS SIMULTANEOUSLY

This can be done by following these two methods:

1. Connect two tape recorders to the **RECORD 1** and **2** jacks as shown in Fig. 7. To monitor the "main 1" recorder, depress both the **MONITOR (TAPE/SOURCE)** and **1/2** pushswitches and to monitor the "main 2" recorder, release the **MONITOR (1/2)** pushswitch only.
2. Connect first tape recorder to the **RECORD 1** (or **2**) jacks and the second tape recorder to the **dubbing OUT** jack. To monitor the first recorder, pull the plug out of the **dubbing IN** jack and depress or release the **MONITOR(1/2)** pushswitch with the **MONITOR(TAPE/SOURCE)** pushswitch depressed. To monitor the second tape recorder only, depress the **MONITOR (TAPE/SOURCE)** pushswitch.

RECORDING A LONG-DURATION PROGRAM

With two tape recorders connected to the Model 2270 as shown in Figure 7, a continuous recording can be made without losing parts of the program during reel changes. For example, with

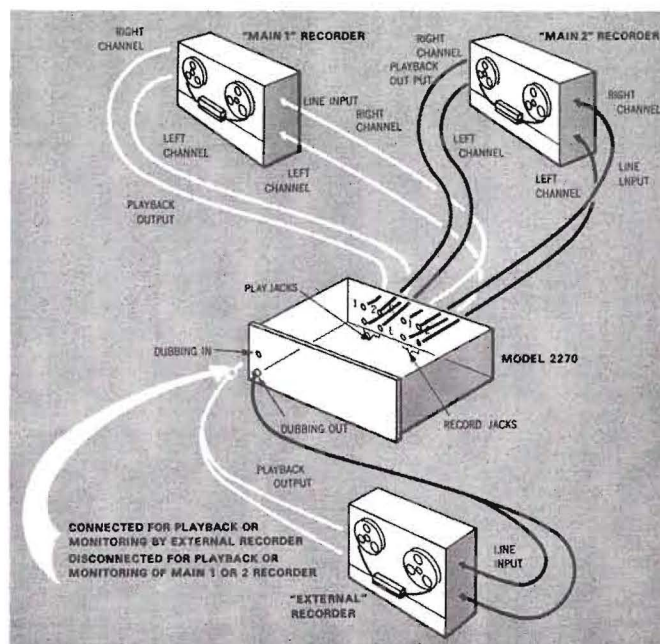


Figure 7. General Arrangement of Tape Recorder

the selector switch set to the desired program source, and the **MONITOR (TAPE/SOURCE)** pushswitch in the "out" position, start the recording on the main 1 recorder, then prepare the main 2 recorder to begin recording before the main 1 recorder is about to run out of tape. As soon as the main 2 recorder is started, ample time will be available to reload the main 1 recorder in preparation for further recording. This process can be repeated indefinitely with both machines. At any time during the recording session, the recording can be monitored by depressing or releasing the **MONITOR (1/2)** pushswitch with **MONITOR (TAPE/SOURCE)** pushswitch depressed. Using the input/output and control facilities of the Model 2270, and two tape recorders, you can copy and edit tapes from one machine to the other. The general arrangement of equipment for copying and editing is illustrated in Figure 7.

COPYING AND EDITING

To copy from the main 1 recorder to the main 2 recorder:

1. Depress the **MONITOR (1/2)** pushswitch.
2. Set the selector switch to "TAPE" and **MONITOR (TAPE/SOURCE)** pushswitch to "out" position.
3. Put the main 2 recorder into the record mode.

Note: In this case NO jack should be connected to the **dubbing IN** jack on the front panel.

To copy from the main 1 (or main 2) recorder to the external recorder:

1. Disconnect the plug from the **dubbing IN** jack.
2. Set the selector switch to "TAPE" and the **MONITOR (TAPE/SOURCE)** pushswitch to "out" position.
3. Put the main 1 (or main 2) recorder into the playback mode and the external recorder into the record mode.
4. Put **MONITOR** pushswitch into 1 (or 2) position.

To copy from the external recorder to the main 1 (or main 2) recorder:

1. Insert the plug into the **dubbing IN** jack.
2. Set the **selector** switch to "TAPE" and **TAPE MONITOR (TAPE/SOURCE)** pushswitch to "out" position.
3. Put the external recorder into the playback mode and the main recorder into the record mode.

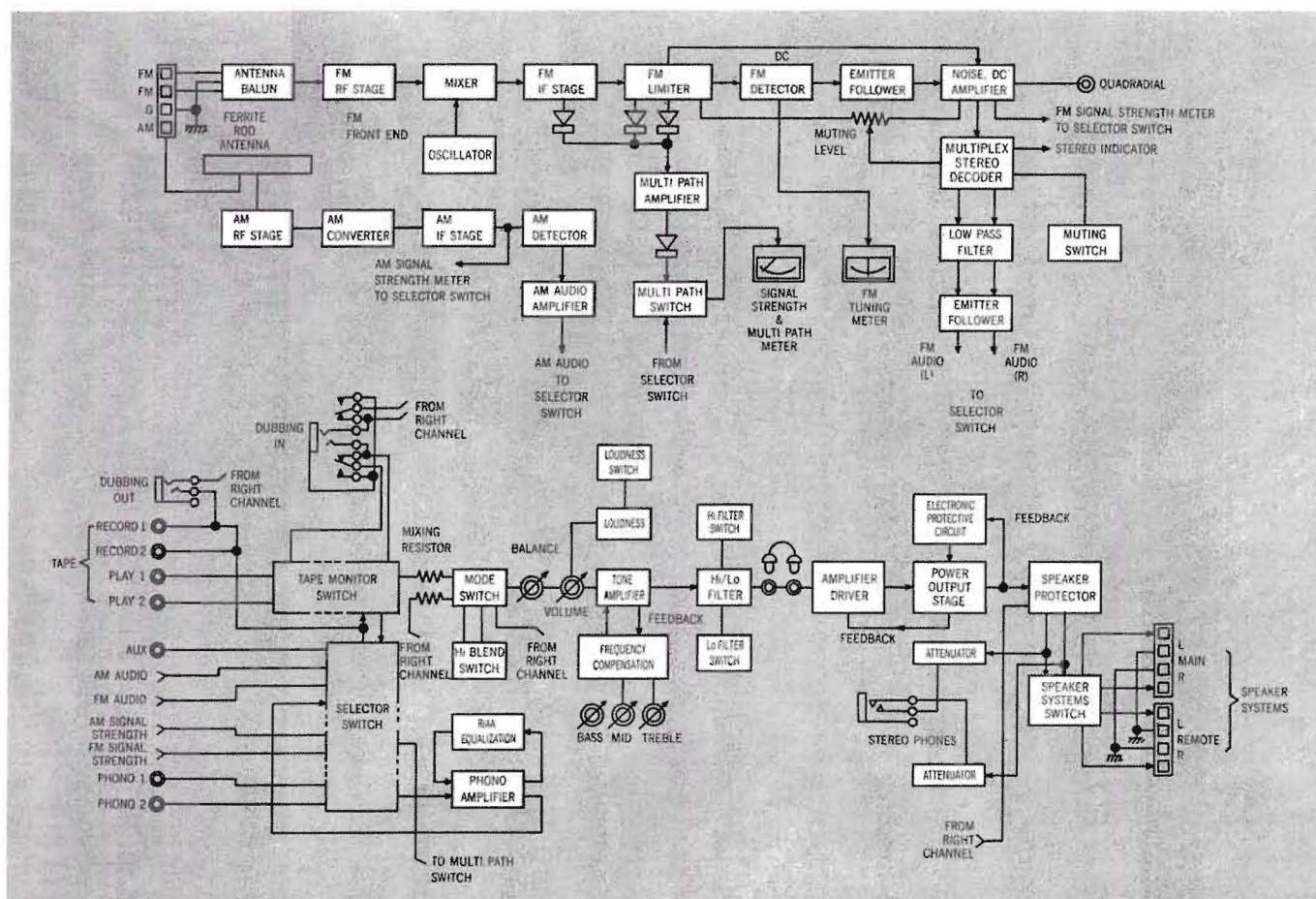
To edit or delete program material you do not wish to include in the copy, simply stop the recorder that is in the record mode, while the unwanted program material is playing. Some machines are equipped with a convenient "pause" control for this purpose.

TECHNICAL DESCRIPTION

GENERAL

Figure 8 is a block diagram of the Model 2270 Receiver showing the main functional elements and input and output signal routing. Each AM and FM front end has its own IF stages. For clarity, only the left audio channel is shown; the right audio channel is identical. The **MONO IN** switch is common to both channels. All audio controls are ganged, or concentrically clutched to their counterparts in the right channel. The left channel half of the front panel **dubbing IN** and **dubbing OUT** jacks are shown interconnected in this diagram. The right channel of each jack is wired to the same circuit point in the right channel.

Figure 8. Functional Block Diagram



FRONT END

FM antenna signals are applied through a balun transformer and the antenna attenuator switch to the antenna coil which drives a field-effect transistor RF amplifier. When the **ATTENUATOR** push-switch is placed in the "OUT" position, the attenuator circuit is cut off and FM signals are directly fed to the FM antenna coil. With **ATTENUATOR** switch placed in the "IN" position, the signals are attenuated about 20dB by the attenuator circuit, then fed to the antenna coil. The amplified signals from the RF amplifier are fed through the triple-tuned RF filter circuit to the FET Mixer stage, which also receives the signal generated by the local oscillator. This mixer converts the carrier frequency to the 10.7 MHz intermediate frequency. Careful attention to its thermal and electrical characteristics has minimized drift, thus obviating the necessity for AFC. The 10.7 MHz converted signal is then fed to a phaselinear ceramic IF filter, followed by an IC limiter. It is then, in turn, processed through an FM discriminator. The output of the FM discriminator is fed to a composite signal amplifier which then drives the demodulator.

FM IF AMPLIFIER

The IF amplifier consists of 8 ceramic filters and 7 stages of IF amplifiers including limiter stages. The characteristics of these ceramic filters are ideal in that the 200KHz passband and phase linearity assures the elimination of a major source of high frequency distortion and loss of stereo separation. The sharp cut-off slopes improve selectivity, permitting reception of closely spaced channels. The Model 2270 utilizes symmetrical diode limiter circuits consisting of high performance Gold Bond diodes and IC limiter amplifier with a very small dynamic aperture. Thus, undesirable Amplitude Modulation is removed from the IF signal within the limiter and good capture ratio is also assured. The amplified and symmetrically limited FM signals are fed to the super-linear discriminator circuit. The detected audio signals are, then, distributed to the **QUADRADIAL** jack, MPX Decoder circuit and Noise Amplifier.

MULTIPATH INDICATOR

The Multipath Indicator circuit is provided to aid you to find the optimum antenna direction for a desired station. Undesirable Amplitude Modulation resulting from multipath reception is detected and displayed on the multipath meter when the **MULTIPATH** pushswitch is held "in". By orientating the antenna for minimum meter deflection, minimum multipath condition is obtained. The audible signals

detected are also fed to the Tone Amplifier through the **MULTIPATH** switch, **balance** and **volume** control and the distorted sound due to the undesirable Amplitude Modulation or the buzz-sound which are proportional to the **MULTIPATH** meter deflection, can be heard through the loudspeakers.

FM STEREO DEMODULATOR

The composite audio signal from the composite signal amplifier is fed into the multiplex stereo demodulator circuit consisting of 11 transistors and 6 diodes. The 19KHz pilot signal contained in the composite audio signal is doubled into 38KHz after two-stage amplification and then the 38KHz signal is further amplified to the level necessary to drive the diode switching circuit. The composite audio signal is decoded into the right and left channels by the 38KHz switching signal in the diode matrix circuit. The right and left channel audio signals are processed in the crosstalk cancelling circuit which utilizes complementary configuration with NPN and PNP transistors. The audio signals are then fed into the selector switch and the **RECORD** jacks from the low-pass filters for filtering undesired 19- and 38KHz components and emitter followers for low impedance output. The stereo demodulator circuit has been designed with the de-emphasis network to provide flat frequency response up to 15KHz. One hundred percent air-tight coils and filters are incorporated in the stereo demodulator circuit for improved stability and reliability with good stereo separation and frequency response.

The multiplex stereo demodulator circuit has been provided with an automatic stereo/monaural switching circuit. The circuit checks the input signal intensity and activates the stereo demodulator circuit and the stereo indicator lamp automatically only when the input signal is powerful enough to provide good quality stereo reception. When the input signal strength is below the threshold level, the FM stereo broadcast is processed as monaural signal and improved signal-to-noise ratio is obtained in this mode of operation.

MUTING CIRCUIT

In the absence of an FM carrier, all FM receivers produce a peculiar noise. The muting circuit eliminates this noise, providing you with noise-free tuning from station to station. A muting circuit, consisting of all semi-conductor switching circuit including two EFTs, has been incorporated in the Model 2270. The muting circuit perfectly mutes out all the interstation noise and also completely mutes out the side slope spurious response of the unit. The circuit has been designed to minimize annoying

"pop" noise for smooth tune in and tune out.

AM TUNER

The AM tuner portion of the Model 2270 has been provided with a tuned RF amplifier incorporating a three-section variable capacitor for improved selectivity and spurious response.

The ceramic filters utilized in the AM IF amplifier have very high selectivity and adequate bandwidth for interference-free AM reception.

Following the AM IF amplifier, the AM detector recovers the audio modulation and provides this signal to the selector switch.

The AM tuner and IF amplifier are subjected to the action of an effective automatic volume control circuit which maintains constant the level of all stations in the AM band.

SELECTOR SWITCH

Your Model 2270 has the capability to operate from a variety of program sources, e.g., AM or FM broadcasts, turntable (PHONO), tape recorders or any other source capable of providing 100 millivolts output level (AUX). The selector switch connects the inputs of the TONE amplifiers selectively to the desired source.

TAPE SIGNALS

With the exception of tape input, all high-level inputs are fed directly to the selector switch. Tape input is routed through the MONITOR (1, 2) push-switch and front panel dubbing IN jack to a section of the MONITOR (TAPE/SOURCE) switch. The dubbing IN jack is a three-conductor stereo jack which has two built-in switches, one for each channel. Normally, these switches are closed, allowing the tape input signals from the PLAY (1 and 2) jacks on the rear panel to be fed to the MONITOR (TAPE/SOURCE) switch. When a plug is inserted in the dubbing IN jack, the switches are opened, disconnecting the PLAY (1 and 2) jacks and allowing the signal from the dubbing IN jack to reach the MONITOR (TAPE/SOURCE) switch. Thus only one tape recorder at a time can feed playback signals into the Model 2270.

MONITOR (TAPE/SOURCE) SWITCH

When the MONITOR (TAPE/SOURCE) pushswitch is in the "out" position tape input signals from the PLAY (1 and 2) jacks on the rear panel or dubbing IN jack on the front panel are fed to the selector switch. When the MONITOR (TAPE/SOURCE) is depressed, the output of the selector switch is disconnected from the balance control

and the tape input signals from the TAPE IN or dubbing IN jacks feed the balance control directly.

MONITOR (1 and 2) SWITCH

This switch selects between the tape PLAY 1 or 2 jacks on the rear panel. Depressing the switch selects input signal connected to the PLAY 1 jacks and releasing the switch (out position) PLAY 2 jacks.

PHONO SIGNALS

Phono signals of up to 100 millivolts can be handled without overloading. The RIAA equalization network provides precise equalization and sets the voltage gain of the phono preamplifier to 40dB (at 1,000Hz). This RIAA reproducing characteristic, together with the recording characteristic, is shown in Figure 9. Notice that the net result after playback is a flat response.

Hi BLEND AND MONO (L and R) FUNCTIONS

When the Hi BLEND switch is depressed the left and right channel outputs of the selector switch are connected together through mixing resistors and a capacitor. The value of the capacitor has been selected to effect moderate suppression of out-of-phase noise and distortion components while maintaining moderate stereo separation. When both MONO (L and R) switches are in the "in" position, the two channels are connected directly together through mixing resistors. In addition, the left and right channel tape input signals are connected together through a similar resistor network. This facility allows all inputs to be converted to the monophonic mode.

CONTROL CIRCUITS

The control circuits portion of the Model 2270 consists of the balance, volume, bass, mid, treble, Hi FILTER, and LOW FILTER controls. All controls affect the left and right channels simultaneously. The bass, mid and treble controls have clutched sections which allow individual adjustment of tonal balance for each channel. With the controls set for flat response and volume control at maximum, the over-all voltage gain from any high-level input to the loudspeaker terminals is approximately 43dB.

BALANCE CONTROL

The balance control is a wide-range control which permits attenuation of each channel to cutoff. The

change of attenuation in each channel as the control is turned away from center has been designed to maintain total apparent loudness from both channels. This feature makes it a true stereo balance control.

VOLUME CONTROL

The **volume** control attenuates both channels simultaneously and maintains tracking to within 3dB at any point of attenuation to -50dB from maximum. Since the control is situated at the input of the tone amplifier, there is no possibility of overlooking the amplifier stages under maximum rated output conditions. Thus, distortion is kept to a minimum. After attenuation by the **balance** and **volume** controls, the signal is applied to the tone amplifier.

TONE AMPLIFIER

The TONE AMPLIFIER's circuitry uses a continuously variable R-C feedback-type configuration. Figure 10 shows the frequency response curves for maximum boost and cut for each control. The signal from the TONE AMPLIFIER feeds the hi/low filter circuit when the **Hi FILTER** or the **LOW FILTER** pushswitch is depressed.

Hi-LOW FILTERS

Figure 11 shows the frequency response curves resulting from use of the two filters.

OUTPUT STAGE AND PROTECTIVE CIRCUITS

The pre-driver circuit amplifies the signal from the **Hi-LOW FILTERS** to sufficient levels to drive the output stages. Beyond the input of the pre-driver circuit, the amplifier stages are direct-coupled through to the loudspeakers (and headphones) providing instantaneous recovery from overdrive or short circuit conditions. The output stage consists of a pair of push-pull, complementary-symmetry transistors (PNP, NPN). The electronic protective circuit senses the peak output current and limits the current to the driver transistors at a safe, predetermined value. This current limiting protects the driver and output transistors under overdrive and short circuit conditions and effectively prevents the driver and output transistor from exceeding safe operating conditions. This instantaneous acting safety circuit gives constant and unobtrusive protection without causing annoying program interruptions.

CAUTION: THE LOUDSPEAKER TERMINALS OF ONE CHANNEL SHOULD NEVER BE CONNECTED DIRECTLY IN PARALLEL WITH ANY OTHER. ANY RESULTING DAMAGE IS NOT COVERED UNDER THE WARRANTY.

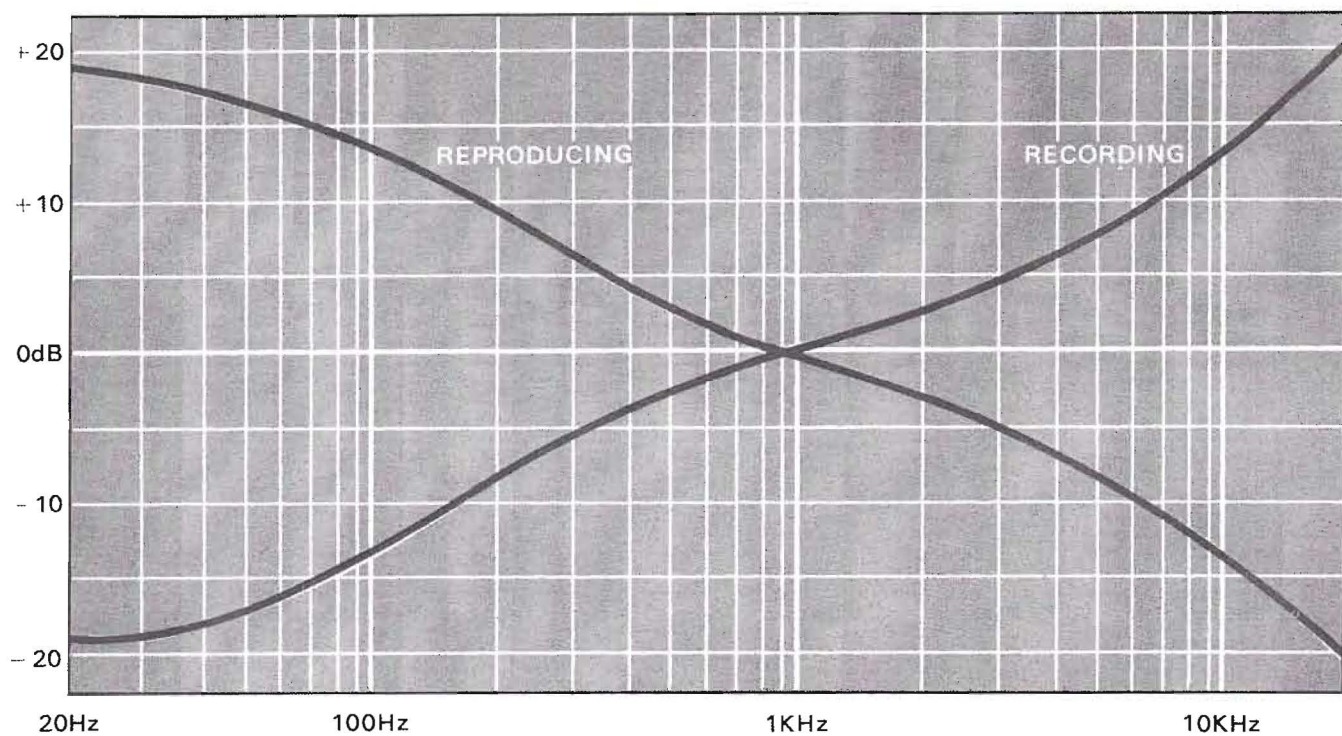
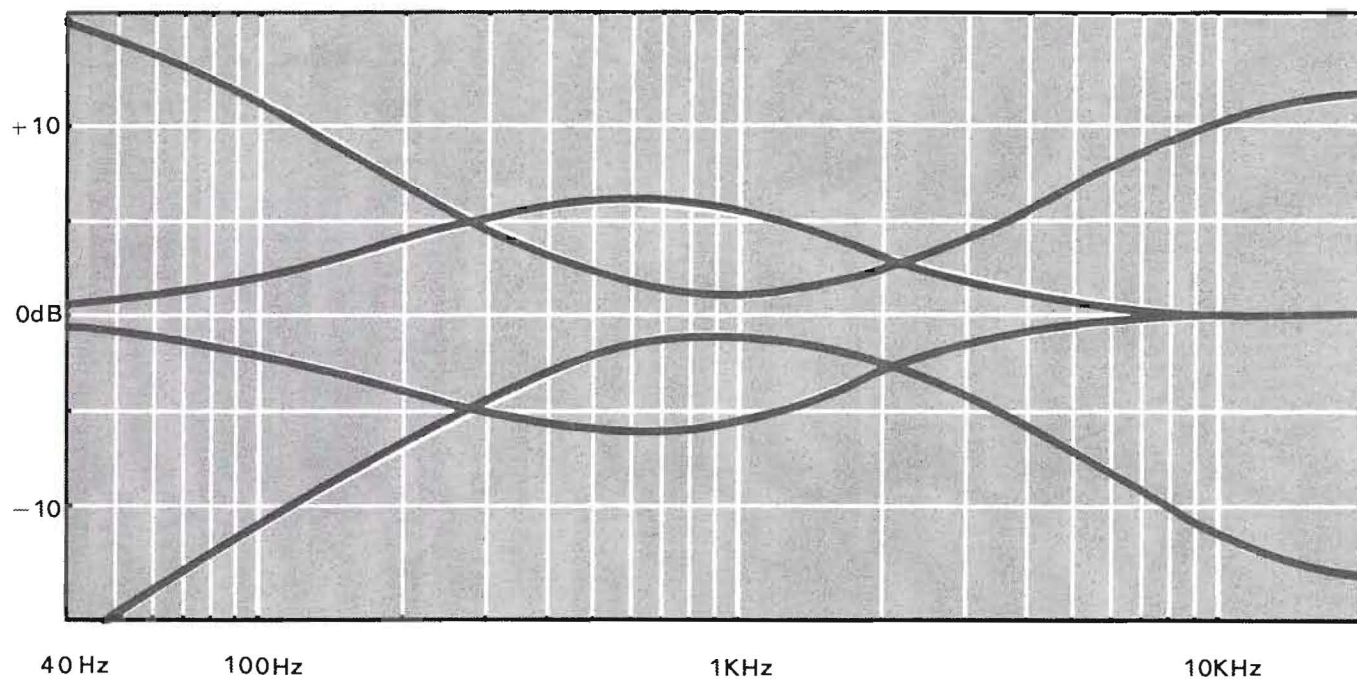


Figure 9. Phono Equalization Characteristics

Figure 10. Tone Control Characteristics



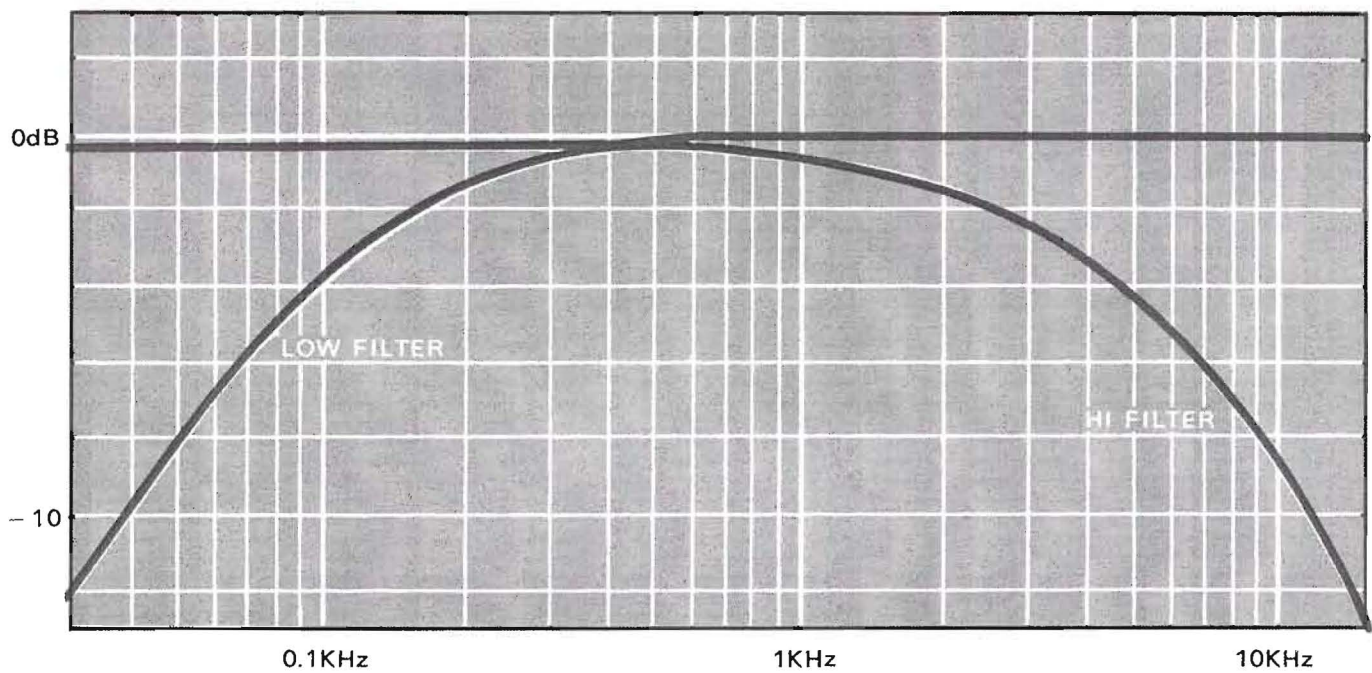
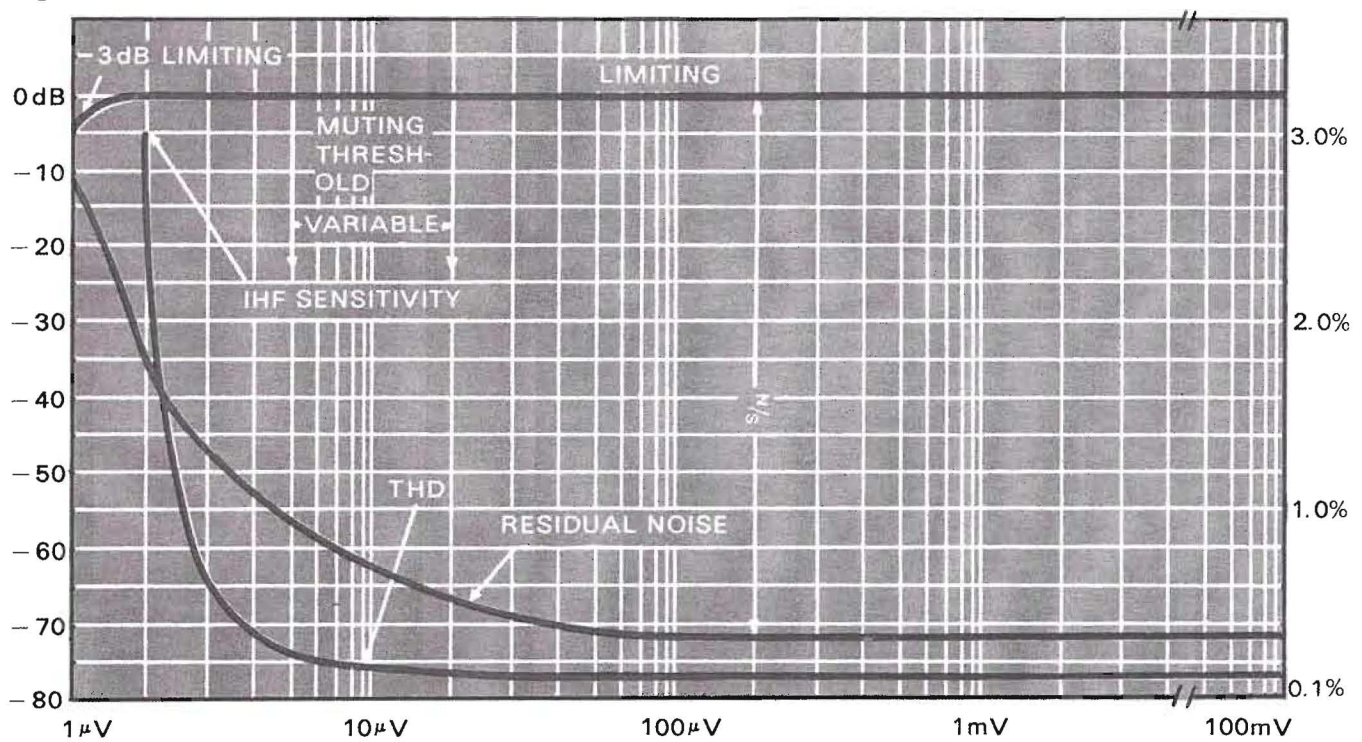


Figure 11. Low and High Filter Characteristics

Figure 12. FM Characteristics



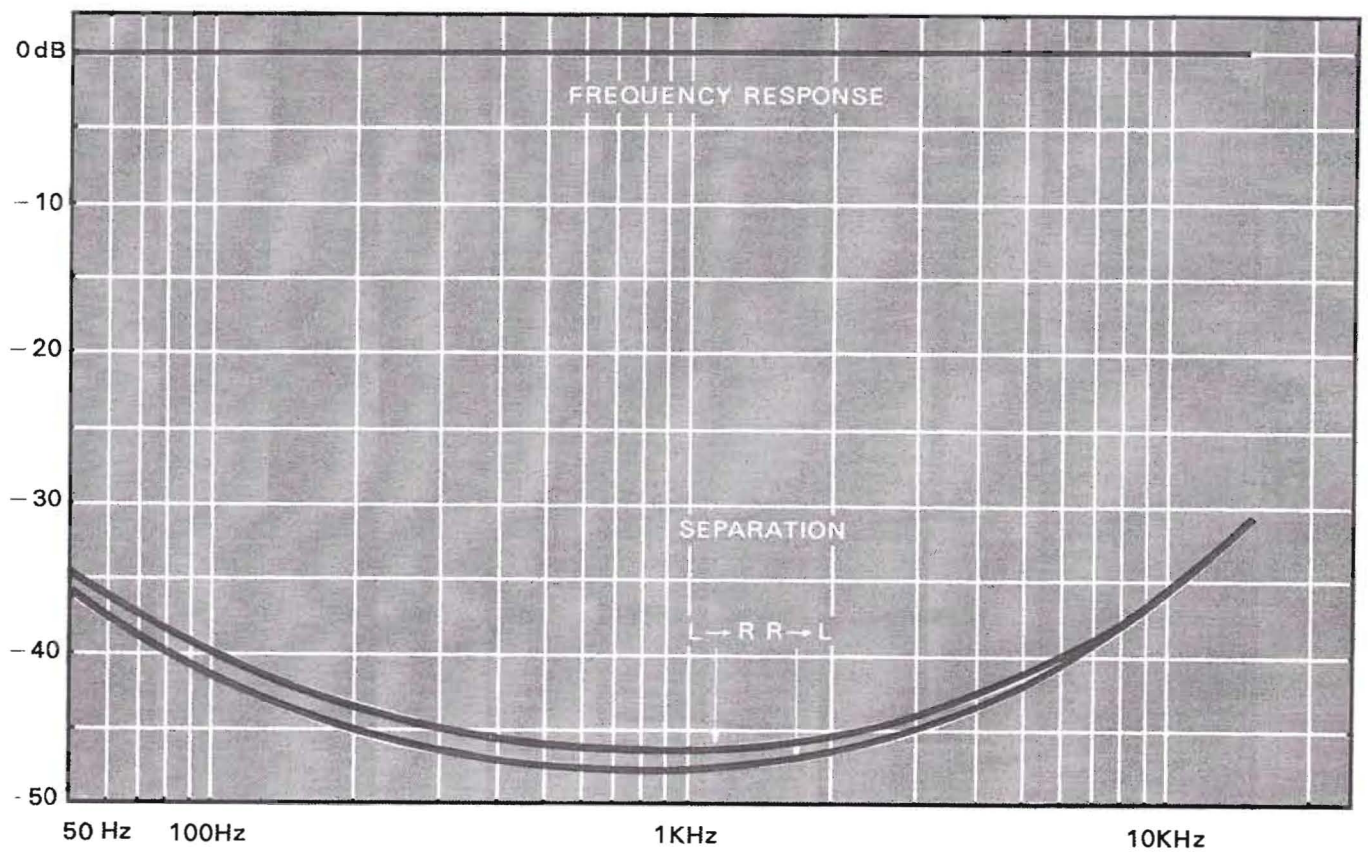
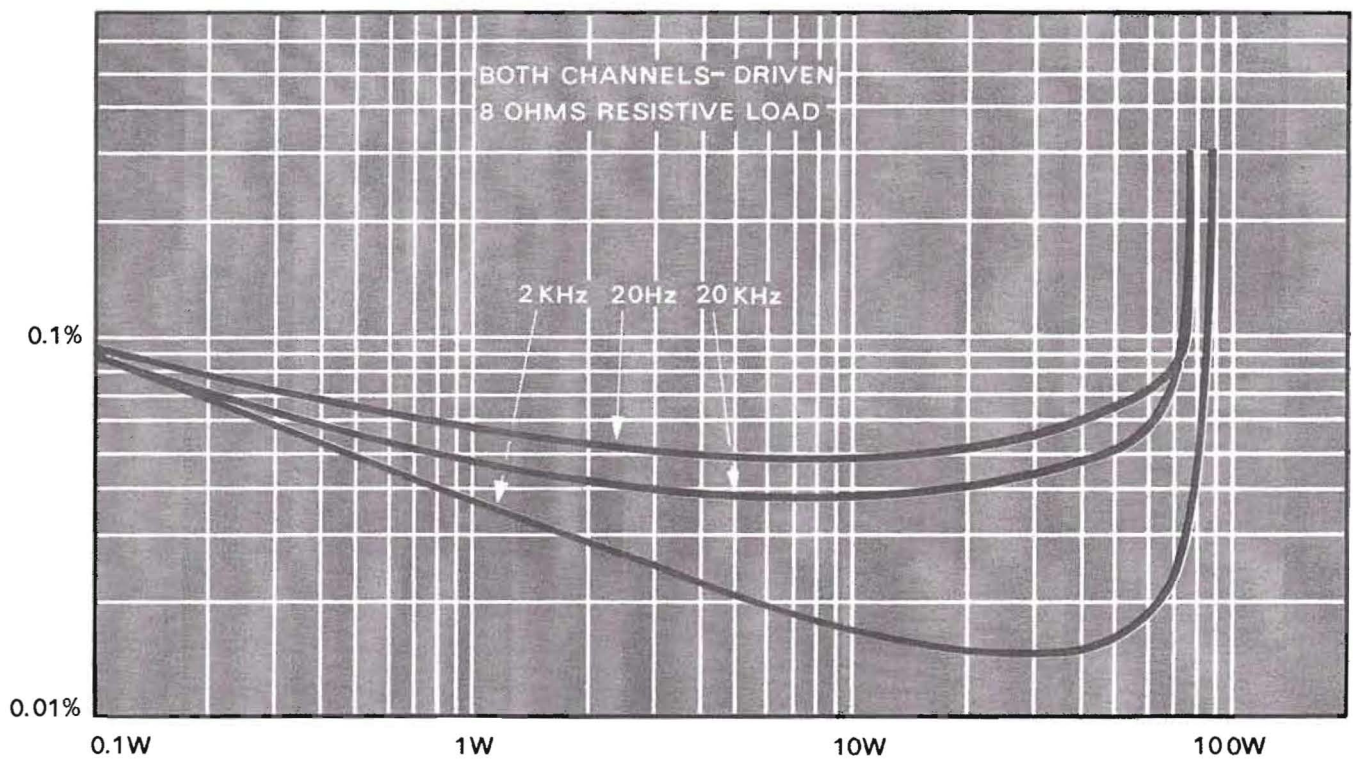


Figure 13. Stereo Separation

Figure 14. Harmonic Distortion



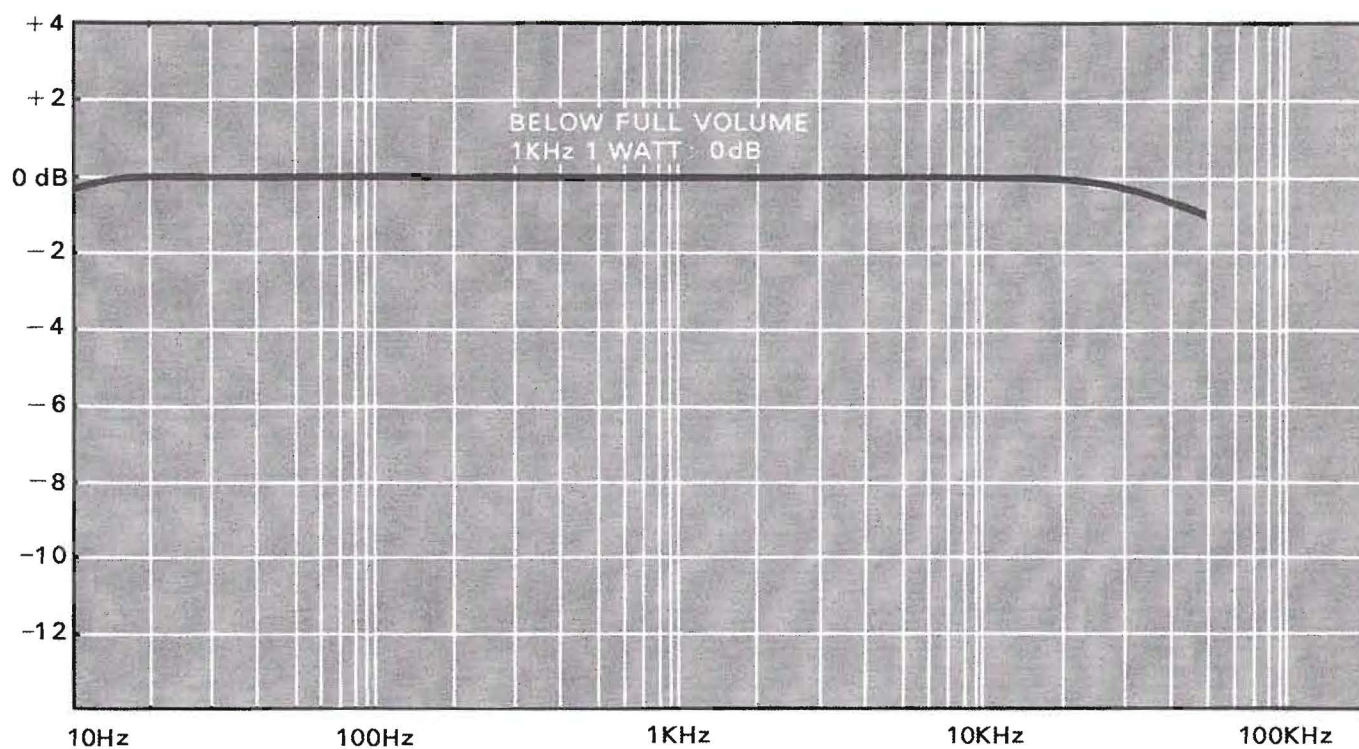


Figure 15. Frequency Response

TECHNICAL SPECIFICATIONS

AUDIO CIRCUITS:

Rated continuous (RMS) power output per channel, both channels operating simultaneously, 20Hz to 20,000Hz.	70 Watts at 4 and 8 ohms 40 Watts at 16 ohms
Comparable Total Music Power (IHF)	210 Watts at 8 ohms
High-level hum and noise (ref. 40W at 8 ohms)	-80 dB
Phono hum and noise	1.5 μ V equivalent input
Dynamic range (phono input to tape recording output)	96 dB
I. M. Distortion (SMPTE), at rated power	0.3%
Distortion decreases as output is lowered	
Total Harmonic Distortion, at rated Power	0.3% Maximum
Distortion decreases as output is lowered	
Power Bandwidth (IHF) for 0.3% THD	7Hz to 50,000Hz
Damping Factor (ref. 8 ohms)	Greater than 45
Frequency Response	
Through phono	± 1 dB
Input Sensitivity (for 40W at 8 ohms)	
High-level180 mV
Phono (1,000 Hz)	1.8 mV
Input Impedance	
High-level	100,000 ohms
Phono	47,000 ohms
Channel Separation 20 Hz to 20,000 Hz	35 dB Minimum

FM SECTIONS:

IHF Usable Sensitivity	2.3 μ V
Selectivity	80 dB
Noise Quieting	-55 dB at 5 μ V -60 dB at 10 μ V -65 dB at 50 μ V
Total Harmonic Distortion, 400 Hz, 100% Mod.	(Mono) 0.2% (Stereo) 0.4%
Frequency Response (ref. 75 μ sec. de-emphasis)	± 1 dB 50 Hz to 15 KHz
Stereo Separation	1,000 Hz 40 dB
Sub-Carrier (38 KHz) Suppression	60dB

GENERAL:

Power Requirements	120VAC 50 to 60 Hz
At rated output, both channels operating	500 Watts
Idling Power (Volume Control at zero)	38 Watts
Dimensions	
Panel Width	17 ²¹ / ₆₄ Inches
Panel Height	5 ²⁵ / ₆₄ Inches
Depth	14 Inches
Weight	
Unit alone	38.5lbs
Packed for shipment	49.5lbs

* These specifications and exterior designs may be changed for improvement without advance notice.

Please Pack the Receiver as Illustrated.

CAUTION

Please **DO NOT** ship your receiver mounted in its accessory walnut cabinet.

Insure receiver for full value:

Make sure that your correct return address is on shipping label.

Ship via a reputable carrier. (**DO NOT USE PARCEL POST**) Be sure to obtain receipt from carrier.

SERVICE NOTES

REPAIRS

Only the most competent and qualified service technicians should be allowed to service the Marantz Model 2270 Receiver. The Marantz Company and its warranty station personnel have the knowledge and special equipment needed for the repair and calibration of this precision instrument.

In the event of difficulty, write directly to the factory (to the attention of the technical service department) for the name and address of the nearest Marantz warranty or authorized service station. Please include the model and serial number of the unit together with a description of the problem.

If it should ever be necessary to ship the unit to the factory or authorized service station and your receiver is mounted in its accessory walnut cabinet, **ALWAYS REMOVE IT FROM THE CABINET BEFORE PACKING. DO NOT SHIP THE ACCESSORY WALNUT CABINET.** Pack the unit carefully, using the original packing material. If the packing material has been discarded, lost, or damaged, write to the factory (to the attention of the technical service department) for new packing material. Carton, fillers, and packing instructions will be shipped to you at a nominal charge.

No receiver should be returned to the factory without an Authorized Return Label which the Marantz Company will supply if the description of difficulties appears to warrant factory service.

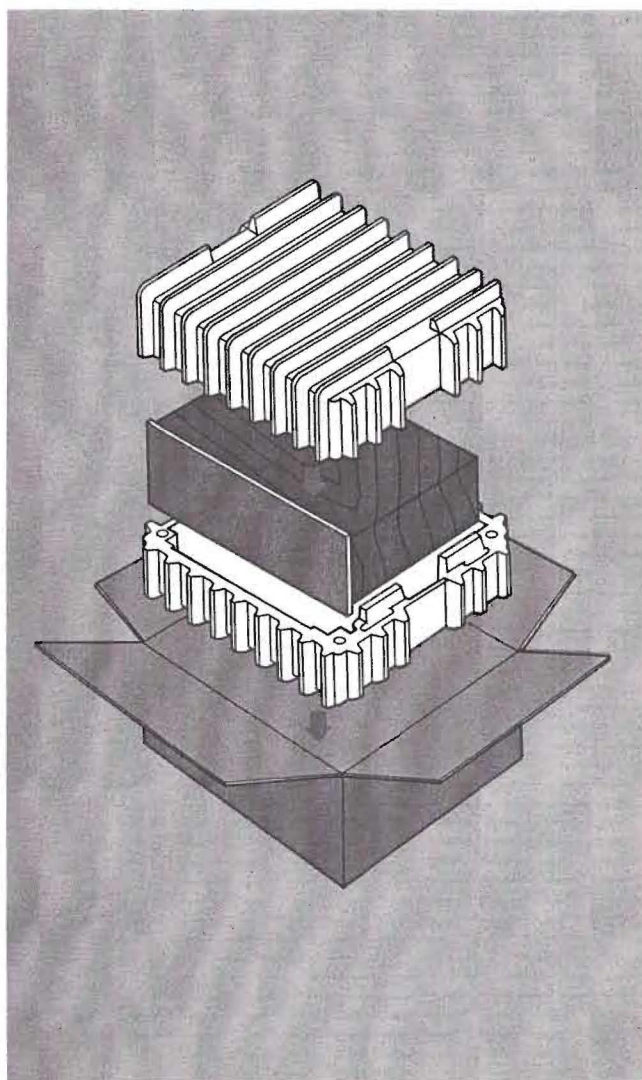


Figure 16. Packing Instructions



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